

**ORISE**  
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

March 30, 2006

Mr. William Snell  
U.S. Nuclear Regulatory Commission  
Region III  
2443 Warrenville Road  
Lisle, IL 60532-4351

**SUBJECT: ANALYTICAL RESULTS FOR 37 WATER SAMPLES FROM THE VICINITY OF THE DRESDEN GENERATING STATION, DRESDEN, ILLINOIS [INSPECTION REPORT NO. 05-000237/2006-003] (RFTA NO. 06-001)**

Dear Mr. Snell:

The Oak Ridge Institute for Science and Education (ORISE) received 37 water samples on March 20 that were collected in the vicinity of the Dresden Generating Station in Dresden, Illinois. The 37 water samples were analyzed for tritium using a liquid scintillation analyzer (Procedures AP2, Revision 15 and CP4, Revision 3). The chain of custody identified the individual water samples to be analyzed by gamma spectroscopy (GS) (Procedure CP1, Revision 15). The sample identifications and collection data are presented in Table 1. The GS data are presented in Table 2. The tritium data are presented in Table 3.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

My contact information is listed below. You may also contact Wade Ivey at 865.576.9184 with any questions or comments.

Sincerely,



Dale Condra, Manager  
Laboratory

RDC:WPI:ar

c: T. McLaughlin, NRC/NMSS/TWFN 7F27  
E. Knox-Davin, NRC/NMSS/TWFN 8A23  
G. Bonano, NRC Region III  
E. Abelquist, ORISE  
S. Kirk, ORISE  
File 1694

Distribution approval and concurrence :	Initials
Technical Management Team Member	SJR
Quality Manager	TUB for ATP

Voice: 865.241.3242

Fax: 865.241.3248

E-mail: CondraD@ora.gov

TABLE 1

SAMPLE IDENTIFICATIONS  
AND COLLECTION DATA  
DRESDEN GENERATING STATION  
DRESDEN, ILLINOIS

ORISE Sample ID	NRC Region III Sample ID	Collection Date	Collection Time
1694W0001	D-06-1-01	2/18/2006	11:00 AM
1694W0002	D-06-1-02	2/19/2006	10:15 AM
1694W0003	D-06-1-03	2/20/2006	12:26 PM
1694W0004	D-06-1-04	2/14/2006	11:30 AM
1694W0005	D-06-1-05	2/21/2006	10:25 AM
1694W0006	D-06-1-06	2/22/2006	12:50 PM
1694W0007	D-06-1-07	2/23/2006	12:05 PM
1694W0008	D-06-1-08	2/24/2006	10:30 AM
1694W0009	D-06-1-09	2/25/2006	8:30 AM
1694W0010	D-06-1-10	2/26/2006	8:15 AM
1694W0011	D-06-1-11	2/27/2006	4:15 PM
1694W0012	D-06-1-12	2/28/2006	8:40 AM
1694W0013	D-06-1-13	3/1/2006	2:15 PM
1694W0014	D-06-1-14	3/2/2006	5:40 PM
1694W0015	D-06-1-15	3/3/2006	12:05 PM
1694W0016	D-06-1-16	3/3/2006	11:25 AM
1694W0017	D-06-1-17	3/3/2006	11:45 AM
1694W0018	D-06-1-18	3/3/2006	12:15 PM
1694W0019	D-06-1-19	3/3/2006	9:15 AM
1694W0020	D-06-1-20	3/3/2006	9:25 AM
1694W0021	D-06-1-21	3/3/2006	9:00 AM
1694W0022	D-06-1-22	3/3/2006	1:05 PM
1694W0023	D-06-1-23	3/3/2006	9:35 AM
1694W0024	D-06-1-24	3/3/2006	12:50 PM
1694W0025	D-06-1-25	3/3/2006	1:00 PM
1694W0026	D-06-1-26	3/3/2006	9:45 AM
1694W0027	D-06-1-27	3/3/2006	9:50 AM
1694W0028	D-06-1-28	3/4/2006	4:40 PM
1694W0029	D-06-1-29	3/5/2006	10:50 AM
1694W0030	D-06-1-30	3/6/2006	11:50 AM
1694W0031	D-06-1-31	3/7/2006	11:00 AM
1694W0032	D-06-1-32	3/8/2006	10:15 AM
1694W0033	D-06-1-33	3/9/2006	1:00 PM
1694W0034	D-06-1-34	3/10/2006	11:20 AM
1694W0035	D-06-1-35	3/11/2006	11:15 AM
1694W0036	D-06-1-36	3/12/2006	8:20 AM
1694W0037	D-06-1-37	3/13/2006	9:40 AM

**TABLE 2**

**CONCENTRATIONS OF SELECTED  
GAMMA EMITTING RADIONUCLIDES  
IN SELECTED WATER SAMPLES  
BY GAMMA SPECTROSCOPY CP1, REVISION 15  
DRESDEN GENERATING STATION  
DRESDEN, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1694W0005	D-06-1-05	3.0 ± 6.1 <sup>b</sup>	0.9 ± 5.1	0.3 ± 5.4	11.5 ± 6.4
1694W0010	D-06-1-10	7.4 ± 8.9	0.4 ± 5.6	-4.0 ± 8.9	-4.1 ± 5.0
1694W0015	D-06-1-15	-2.4 ± 4.9	0.0 <sup>c</sup> ± 4.7	3.2 ± 4.8	4.2 ± 4.3
1694W0020	D-06-1-20	1.0 ± 6.4	0.1 ± 6.0	-1 ± 10	3.2 ± 5.3
1694W0025	D-06-1-25	-0.6 ± 6.7	3.4 ± 5.4	-5.9 ± 9.0	1.6 ± 4.9
1694W0030	D-06-1-30	2.0 ± 5.2	2.8 ± 5.3	2.7 ± 5.4	11.2 ± 7.7
1694W0035	D-06-1-35	-0.8 ± 5.5	5 ± 11	-3.5 ± 9.4	2.6 ± 6.0

<sup>a</sup>The range of MDCs for the selected radionuclides is 7.5 pCi/L to 11 pCi/L.

<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

<sup>c</sup>Zero values are due to rounding.

TABLE 3

**CONCENTRATIONS OF TRITIUM  
IN WATER SAMPLES  
BY LIQUID SCINTILLATION ANALYSIS  
AP2, REVISION 15; CP4, REVISION 3  
DRESDEN GENERATING STATION  
DRESDEN, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPU's, and MDCs <sup>a</sup> (pCi/L)
1694W0001	D-06-1-01	61,600 ± 1,500 <sup>b</sup> (390)
1694W0002	D-06-1-02	36,700 ± 1,100 (390)
1694W0003	D-06-1-03	74,300 ± 1,700 (390)
1694W0004	D-06-1-04	570 ± 130 (200)
1694W0005	D-06-1-05	11,040 ± 610 (430)
1694W0006	D-06-1-06	14,000 ± 670 (390)
1694W0007	D-06-1-07	7,210 ± 500 (390)
1694W0008	D-06-1-08	43,500 ± 1,200 (390)
1694W0009	D-06-1-09	2,650 ± 350 (390)
1694W0010	D-06-1-10	-20 ± 240 (430)
1694W0011	D-06-1-11	47,600 ± 1,300 (390)
1694W0012	D-06-1-12	9,490 ± 560 (390)
1694W0013	D-06-1-13	71,200 ± 1,600 (390)
1694W0014	D-06-1-14	4,580 ± 420 (390)
1694W0015	D-06-1-15	-260 ± 230 (430)
1694W0016	D-06-1-16	115,500 ± 2,200 (390)
1694W0017	D-06-1-17	6,790 ± 490 (390)
1694W0018	D-06-1-18	290 ± 240 (390)
1694W0019	D-06-1-19	10,130 ± 590 (430)
1694W0020	D-06-1-20	560 ± 270 (430)
1694W0021	D-06-1-21	460 ± 270 (430)
1694W0022	D-06-1-22	670 ± 280 (430)
1694W0023	D-06-1-23	4,310 ± 420 (430)
1694W0024	D-06-1-24	1,000 ± 290 (430)
1694W0025	D-06-1-25	1,750 ± 330 (430)
1694W0026	D-06-1-26	6,410 ± 490 (430)
1694W0027	D-06-1-27	3,820 ± 400 (430)
1694W0028	D-06-1-28	131,100 ± 2,400 (430)
1694W0029	D-06-1-29	10,040 ± 580 (430)
1694W0030	D-06-1-30	14,100 ± 680 (430)
1694W0031	D-06-1-31	7,550 ± 520 (430)
1694W0032	D-06-1-32	83,300 ± 1,300 (220)
1694W0033	D-06-1-33	250,300 ± 3,900 (430)

TABLE 3 (continued)

CONCENTRATIONS OF TRITIUM  
IN WATER SAMPLES  
BY LIQUID SCINTILLATION ANALYSIS  
AP2, REVISION 15; CP4, REVISION 3  
DRESDEN GENERATING STATION  
DRESDEN, ILLINOIS

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)
1694W0034	D-06-1-34	43,500 ± 1,200 (430)
1694W0035	D-06-1-35	6,540 ± 490 (430)
1694W0036	D-06-1-36	225,800 ± 3,600 (430)
1694W0037	D-06-1-37	1,320 ± 310 (430)

<sup>a</sup>MDCs are in parenthesis.

<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.